

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : CANON INC

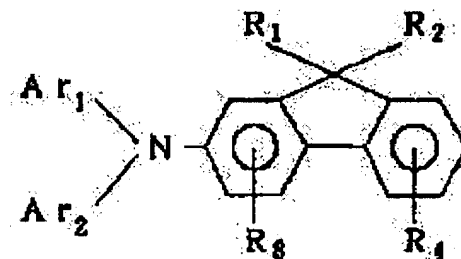
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TANAKA TAKAKAZU(54) ELECTROPHOTOGRAPHIC SENSITIVE BODY, ELECTROPHOTOGRAPHIC DEVICE AND FACSIMILE
HAVING THE SAME

(57)Abstract:

PURPOSE: To provide an electrophotographic sensitive body having high sensitivity and hardly causing a change in the potential of the light part and that of the dark part at the time of repeated use, an electrophotographic device with the sensitive body and a facsimile with the sensitive body.

CONSTITUTION: This electrophotographic sensitive body has a photosensitive layer on the electric conductive substrate and the photosensitive layer contains a fluorene compd. represented by formula, wherein each of R1-R4 is alkyl, aralkyl, etc., each of Ar1 and Ar2 is an arom. cyclic group or a heterocyclic group and at least one of Ar1 and Ar2 has two or more substituents selected among halogen, hydroxyl, alkyl, alkoxy and aralkyl.



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NOTICES

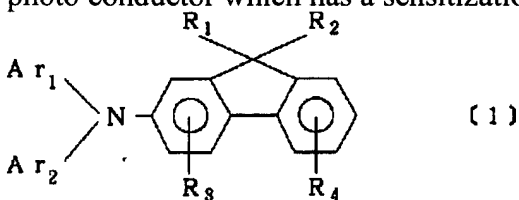
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CLAIMS

[Claim(s)]

[Claim 1] The electrophotography photo conductor, [Formula 1] which are characterized by containing the fluorene compound in which this sensitization layer is shown by the following general formula [1] in the electrophotography photo conductor which has a sensitization layer on a conductive base material



(R1 and R2 show a hydrogen atom, an alkyl group, an aralkyl radical, or a ring radical among a formula.) R3 And R4 A hydrogen atom, a halogen atom, a hydroxyl group, an alkyl group, an aralkyl radical, or an alkoxy group is shown. Ar1 And Ar2 The ring radical or heterocycle radical which has at least two substituents X is shown, and X shows a halogen atom, a hydroxyl group, an alkyl group, an alkoxy group, or an aralkyl radical. .

[Claim 2] Electrophotography equipment characterized by having an electrophotography photo conductor according to claim 1.

[Claim 3] Facsimile characterized by having a receiving means to have an electrophotography photo conductor according to claim 1, and to receive the image information from a remote terminal.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the electrophotography photo conductor which has the low-molecular organic photoconductivity compound which gives the improved electrophotographic properties in detail about an electrophotography photo conductor.

[0002]

[Description of the Prior Art] The inorganic photo conductor which has the sensitization layer which uses a selenium, a zinc oxide, cadmium, etc. as a principal component as an electrophotography photo conductor conventionally has been used widely. Although it has a certain amount of [these] basic property, there are problems -- a manufacturing cost with bad plasticity with difficult membrane formation nature is high. Furthermore, generally the inorganic photoconductivity ingredient had strong toxicity, and was dealt with in the manufacture top list, and, also upwards, big constraint was.

[0003] On the other hand, the organic photo conductor which uses an organic photoconductivity compound as a principal component has many advantages, such as compensating the above-mentioned fault of an inorganic photo conductor, attracts attention in recent years, and much proposals are made and it is put in practical use partly until now.

[0004] the photoconductivity polymer represented by Polly N-vinylcarbazole as such an organic photo conductor, and 2, 4, and 7-trinitro-9-full -- me -- the electrophotography photo conductor which uses as a principal component the electron donor acceptor complex formed from Lewis acid, such as non, is proposed. Although excelled in respect of lightweight nature and membrane formation nature etc. compared with the inorganic photoconductivity polymer, these organic photoconductivity polymers are inferior compared with the inorganic photoconductivity matter in respect of sensibility, endurance, the stability by the environmental variation, etc., and cannot necessarily be satisfied.

[0005] The functional discrete-type electrophotography photo conductor which, on the other hand, made the charge generating function and the charge transportation function share with the respectively separate matter brought about the improvement remarkable in the sensibility and endurance which were made into the fault of the conventional organic photo conductor. It has the advantage that each ingredient selection range of the charge generating matter and the charge transportation matter of such a functional discrete-type photo conductor is wide, and the electrophotography photo conductor which has the property of arbitration can be created comparatively easily.

[0006] As charge generating matter, various azo pigments, a polycyclic quinone pigment, cyanine dye, a square rucksack acid color, pyrylium salt system coloring matter, etc. are known. Much structure is advocated for the ingredient composition with the large charge generating capacity for lightfastness of an azo pigment to be strong, from the point of easy ** also in it.

[0007] On the other hand as charge transportation matter, the stilbene compound of the triphenylamine compound of the pyrazon compound of the pyrazoline compound of JP,52-4188,B, JP,55-42380,B, and JP,55-52063,A, JP,58-32372,B, and JP,61-132955,A, JP,54-151955,A, and JP,58-198043,A etc. is known, for example.

[0008] thing (3 [stable to the ozone and NOx which are generated by thing (2) corona discharge with stable to (1) light and heat being required of these charge transportation matter, a nitric acid, etc.] --) -- it is mentioned that the thing (5) manufacture with high compatibility with having-high charge transportation ability (4) organic solvent and a binder is easy, and cheap etc. However, although a part of above-mentioned demand satisfies the charge transportation matter using the conventional low-molecular organic compound, there is nothing are altogether satisfied with high level of.

[0009] Moreover, by carrying out the mothball of the photo conductor in inside, such as a copying machine, the point which crystallization and the phenomenon of carrying out phase separation may happen, and cracking crack **** and the charge transportation matter may serve as an image defect, and should improve also has many charge transportation

layers.

[0010]

[Problem(s) to be Solved by the Invention] Therefore, the purpose of this invention is canceling the various faults which the conventional photo conductor's has by offering the organic photoconductivity compound with which it was satisfied of the property required of the charge transportation compound described previously enough.

[0011] That is, it has big sensibility in the first place, and, moreover, the potential at the time of use is repeatedly to offer an electrophotography photo conductor maintainable to stability.

[0012] It is in offering the electrophotography photo conductor with which crystallization of the cracking crack of a sensitization layer or the charge transportation matter does not take place even if it carries out [second] a mothball to inside, such as a copying machine.

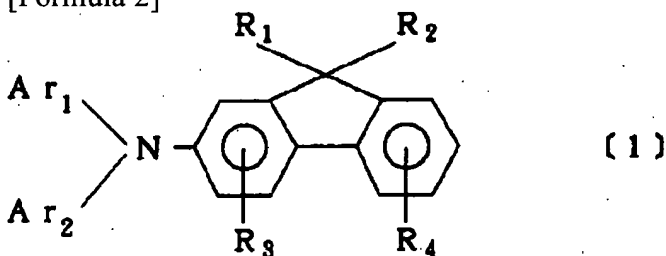
[0013] Offering the new organic photoconductivity compound which can be offered easily cheaply has the third manufacture.

[0014]

[Means for Solving the Problem] this invention persons -- the above-mentioned high sensitivity -- high -- it resulted in header this invention that the fluorene compound of specification as a result of inquiring wholeheartedly about the organic photoconductivity compound which offers a durability electrophotography photo conductor was suitable.

[0015] That is, this invention is the electrophotography photo conductor characterized by containing the fluorene compound in which this sensitization layer is shown by the following general formula [1] in the electrophotography photo conductor which has a sensitization layer on a conductive base material, and [0016].

[Formula 2]



(R1 and R2 show a hydrogen atom, an alkyl group, an aralkyl radical, or a ring radical among a formula.) R3 And R4 A hydrogen atom, a halogen atom, a hydroxyl group, an alkyl group, an aralkyl radical, or an alkoxy group is shown. Ar1 And Ar2 The ring radical or heterocycle radical which has at least two substituents X is shown, and X shows a halogen atom, a hydroxyl group, an alkyl group, an alkoxy group, or an aralkyl radical. it is .

[0017] It sets to a general formula [1] and they are Ar1 and Ar2. Heterocycle radicals, such as ring radicals, such as an aryl group, a naphthyl group, etc. which have at least two or more substituents X, or a pyridine ring, a thiophene ring, and a furan ring, are expressed. Substituent X expresses halogen atoms, such as aralkyl radicals, such as alkyl groups, such as methyl, ethyl, and propyl, benzyl, and phenethyl, methoxy, an alkoxy group of ethoxy **, a fluorine, chlorine, and a bromine, or a hydroxyl group.

[0018] R1 and R2 Ring radicals, such as aralkyl radicals, such as alkyl groups, such as methyl, ethyl, and propyl, benzyl, and phenethyl, phenyl, and naphthyl, or a hydrogen atom is expressed. R3 And R4 Halogen atoms, such as aralkyl radicals, such as alkyl groups, such as methyl, ethyl, and propyl, benzyl, and phenethyl, methoxy, an alkoxy group of ethoxy **, a fluorine, chlorine, and a bromine, a hydroxyl group, or a hydrogen atom is expressed.

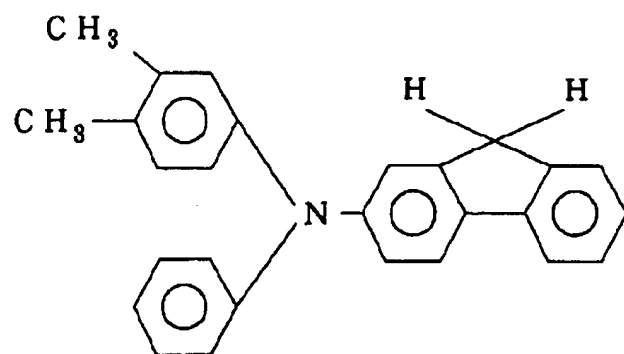
[0019] Moreover, R1 Or R4 As a substituent which may have the substituent respectively and you may have, halogen atoms, such as aralkyl radicals, such as aryloxy groups, such as alkyl groups, such as methyl, ethyl, and propyl, methoxy, the alkoxy group of ethoxy **, phenoxy, and naphthoxy one, benzyl, and phenethyl, a fluorine, chlorine, and a bromine, are raised. In addition, it sets to a general formula [1] and is R1. R2 Especially the case where it is an alkyl group is desirable to coincidence.

[0020] The example of representation is given about the compound shown by the general formula [1] below. However, it is not limited to these compounds.

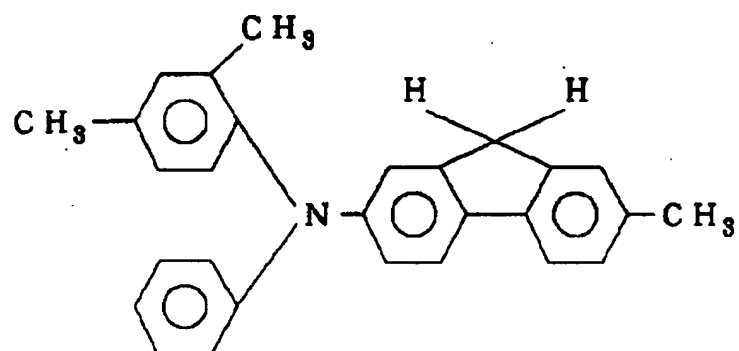
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[Formula 3]

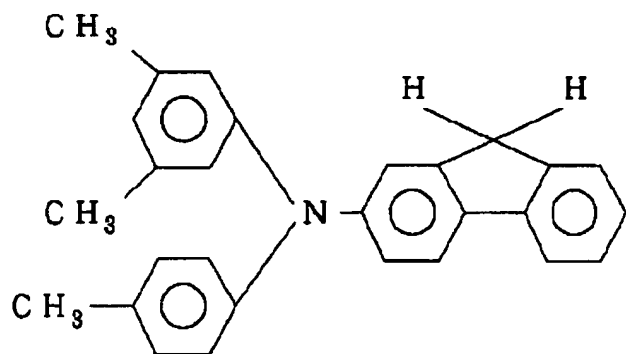
(1)



(2)



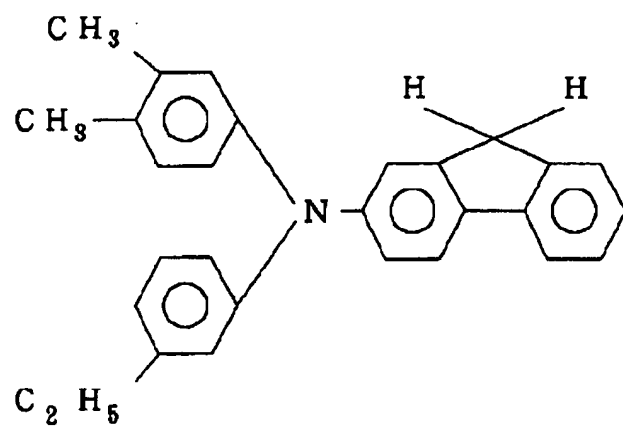
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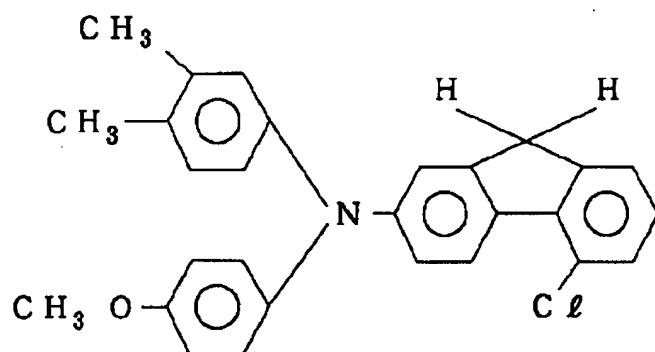
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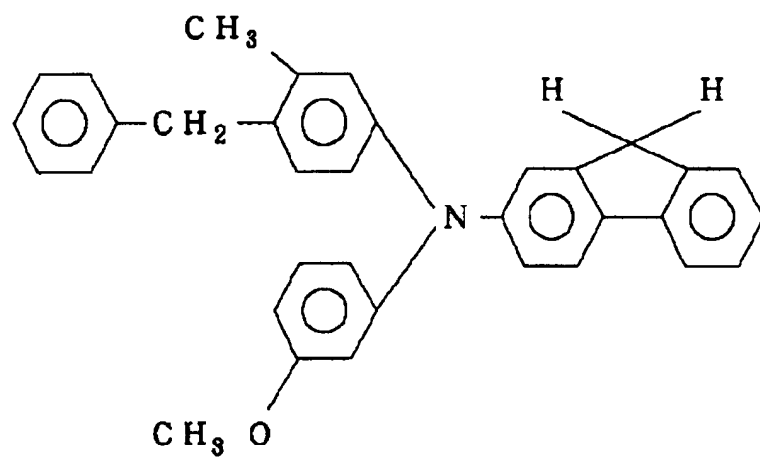
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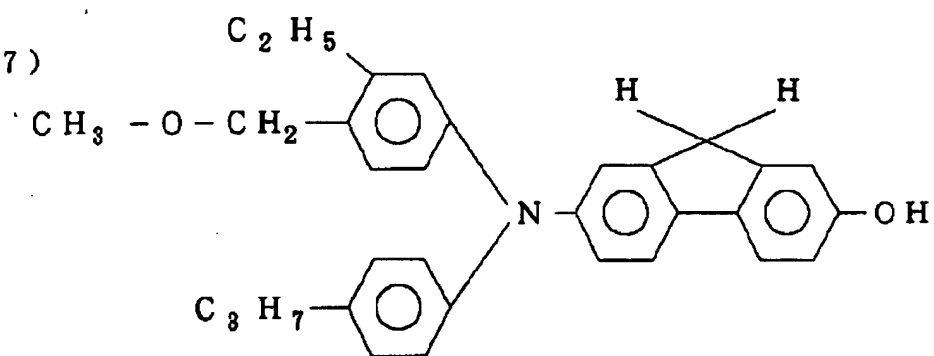
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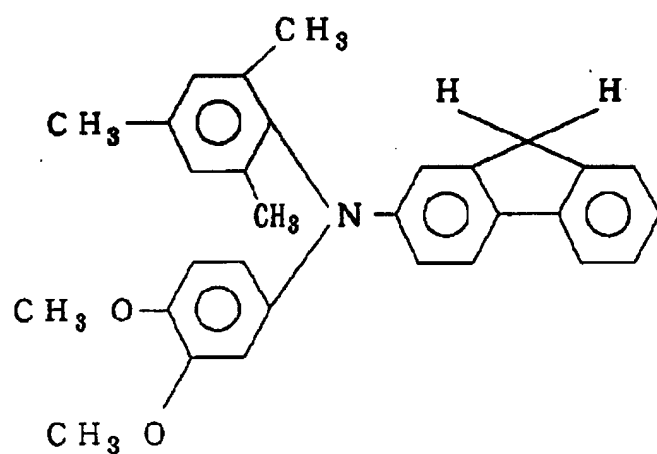
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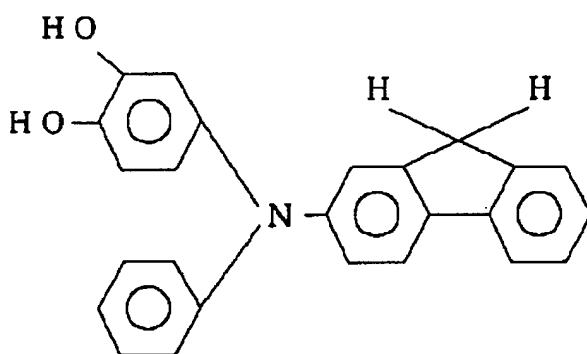
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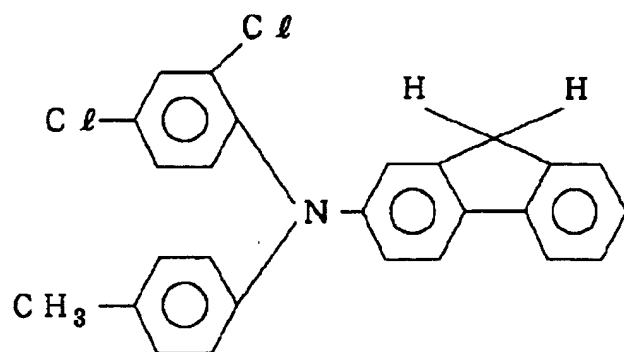
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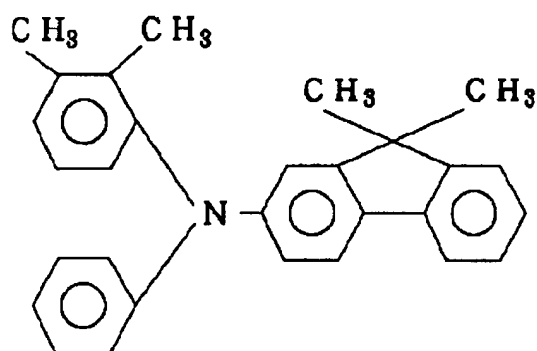
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[Formula 6]

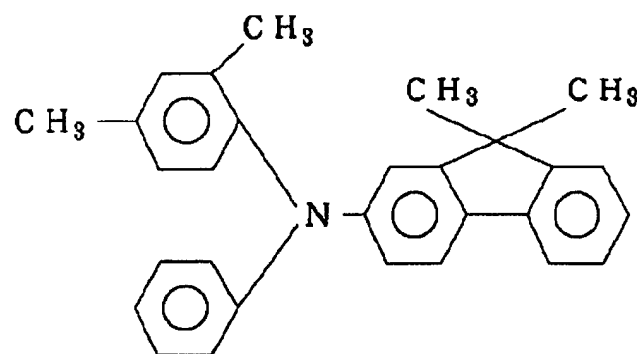
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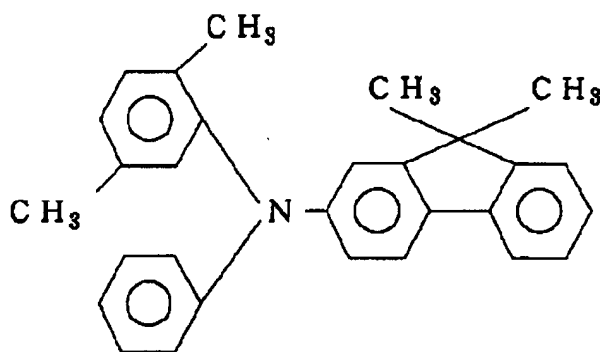
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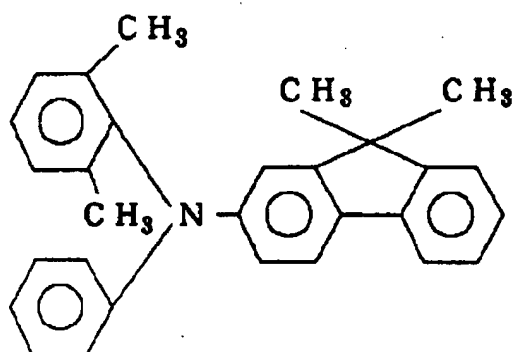
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[Formula 7]

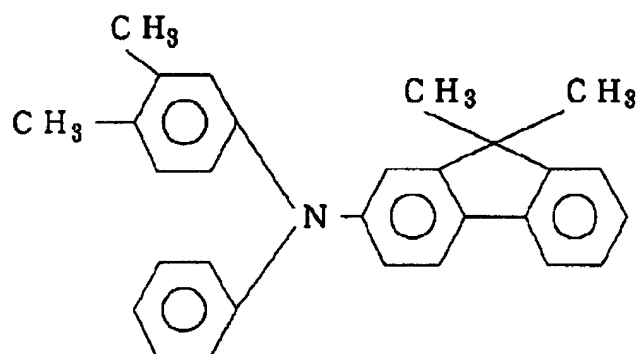
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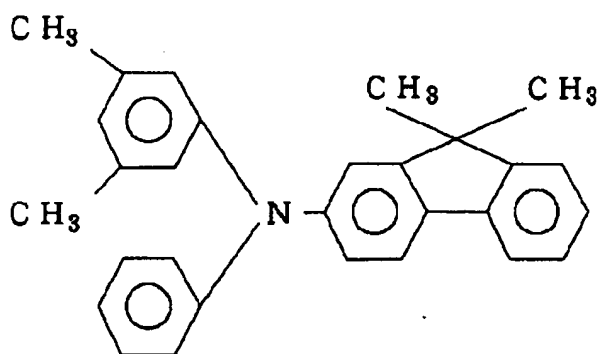
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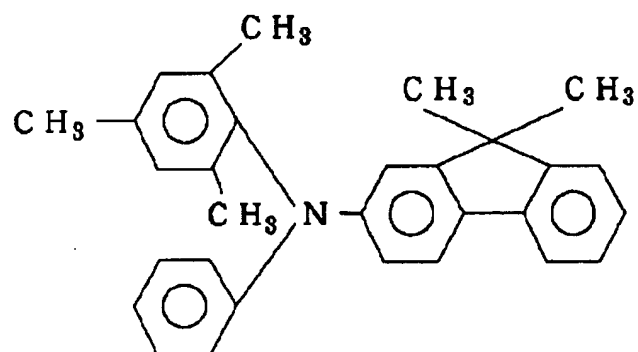
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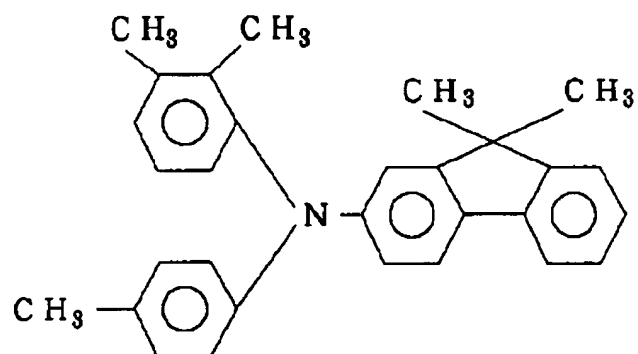
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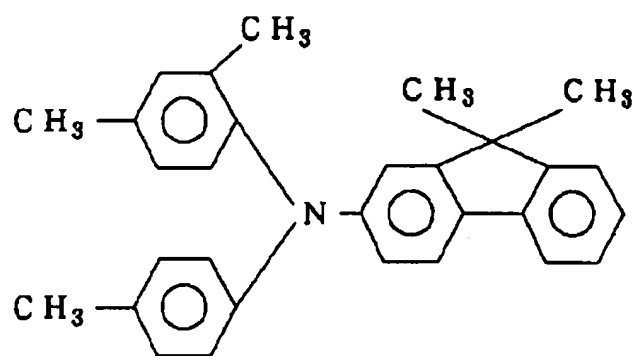


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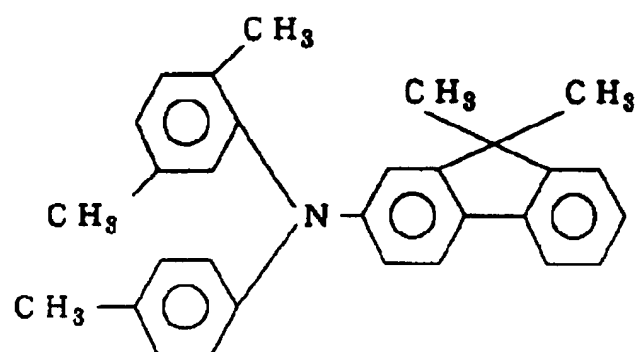


[0027]
[Formula 9]

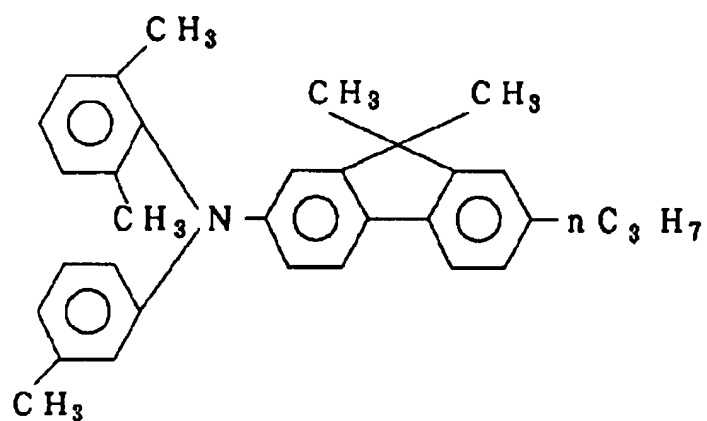
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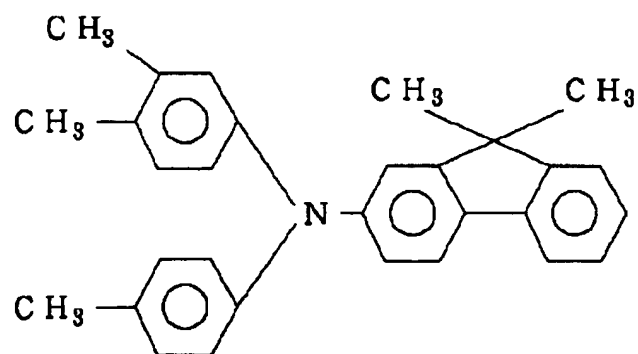
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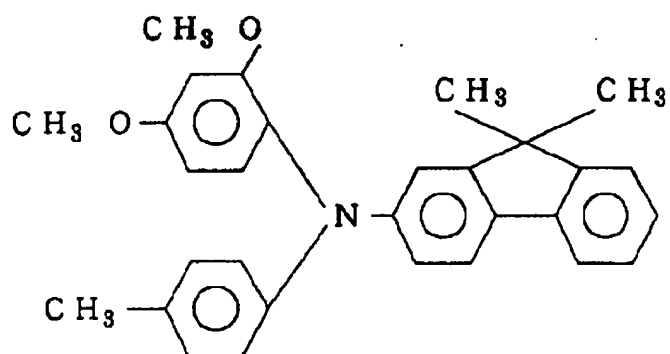
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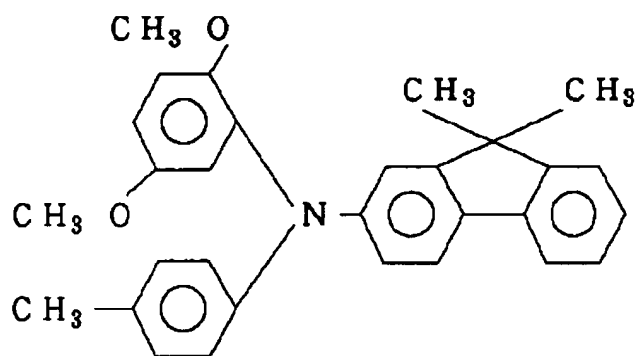
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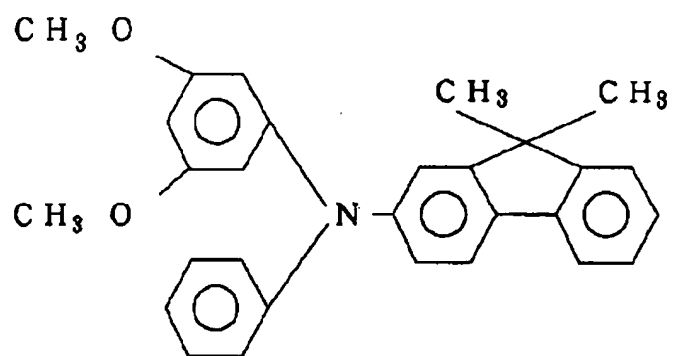
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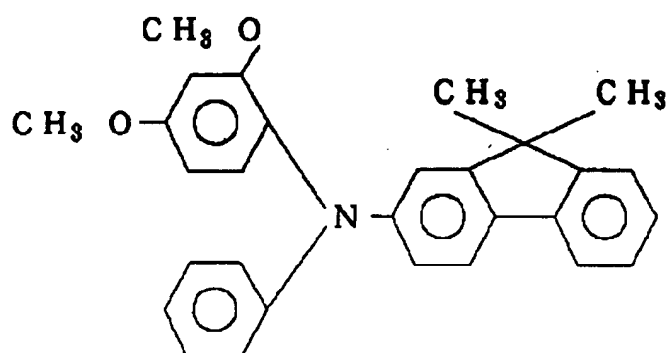
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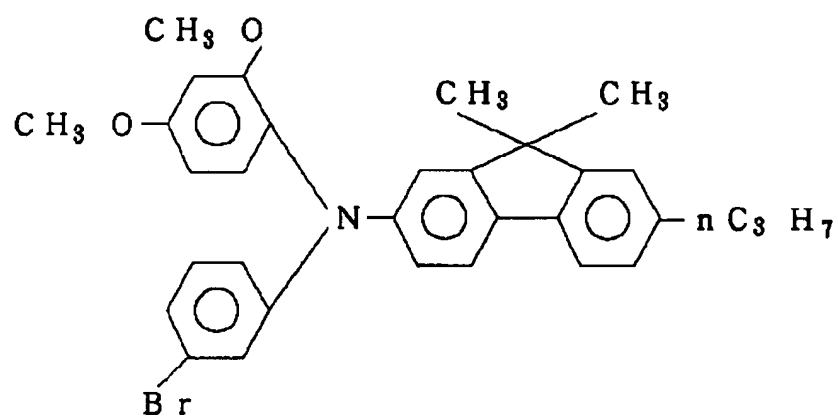
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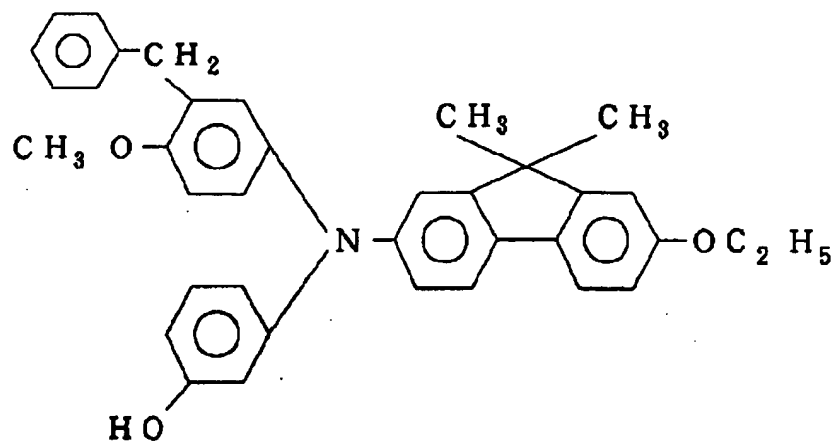
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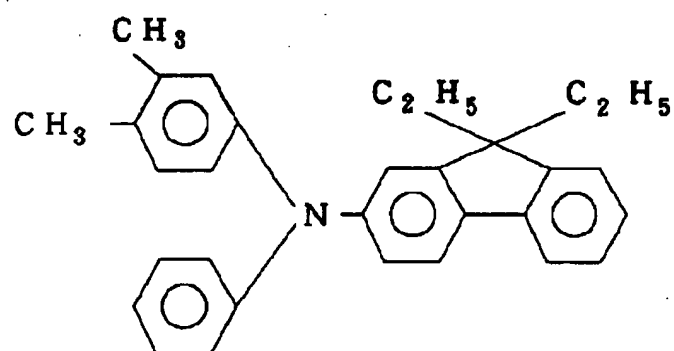
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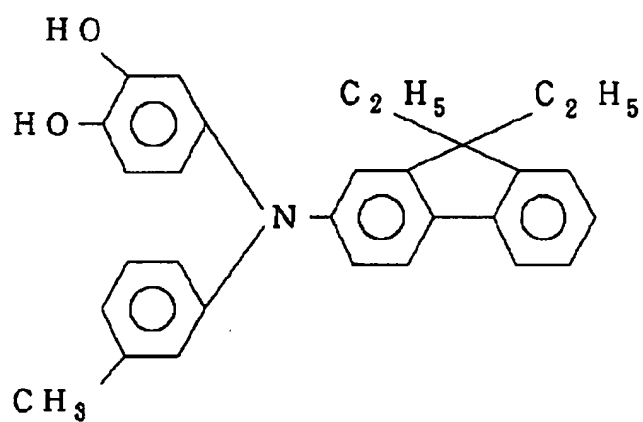
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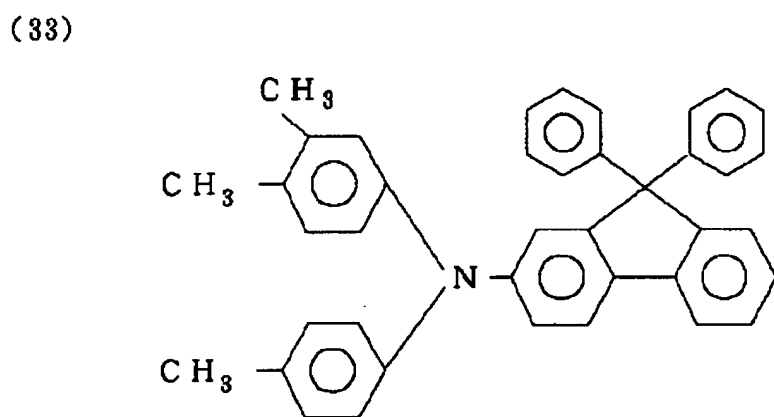
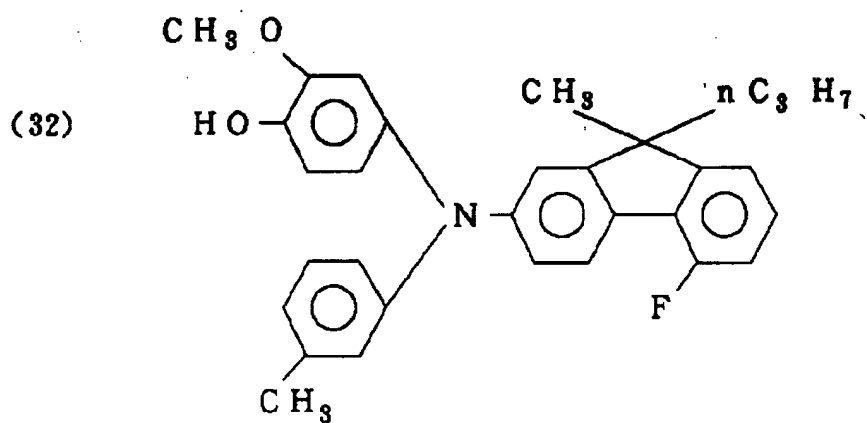
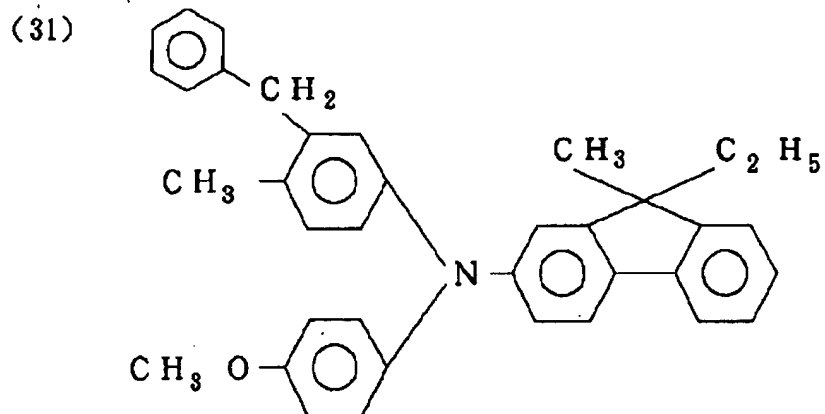


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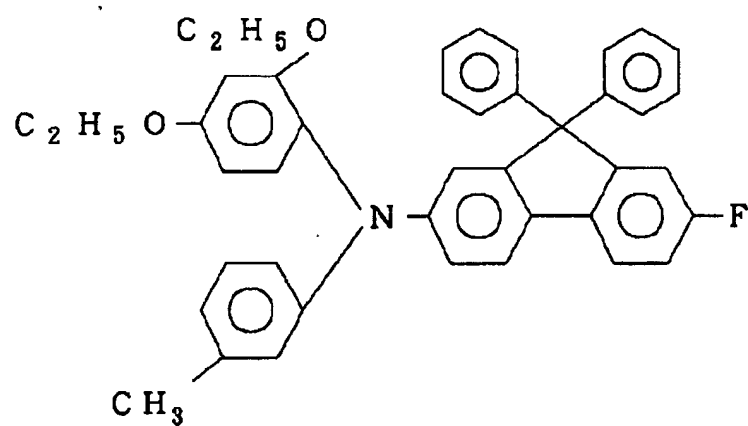
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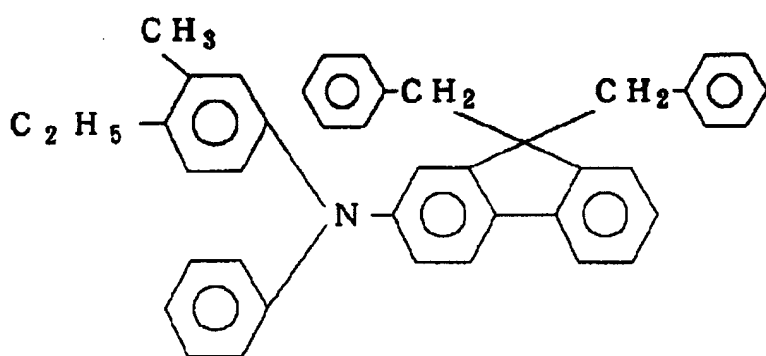


[0032]
[Formula 14]

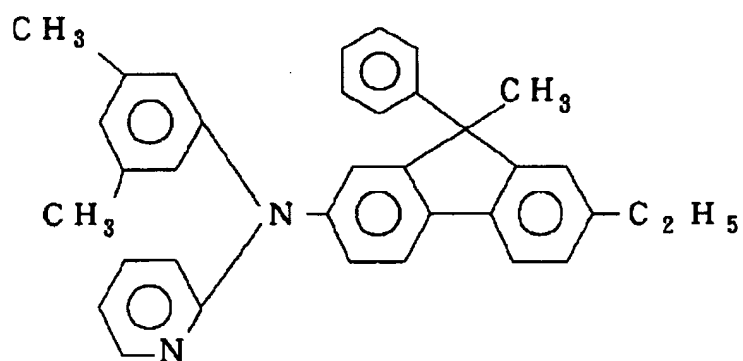
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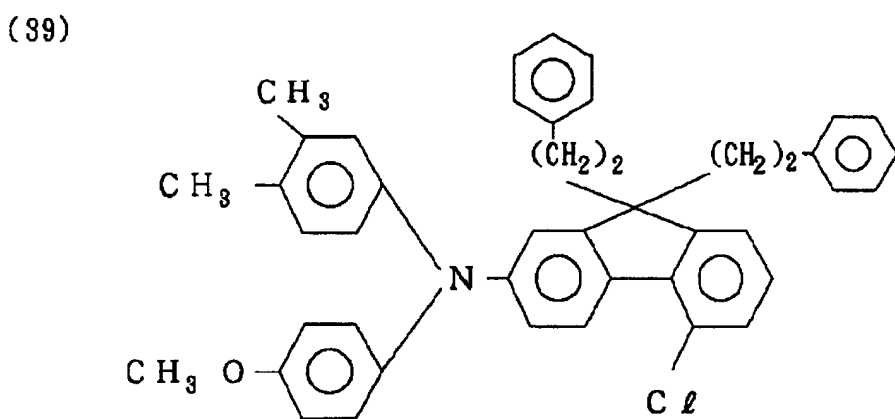
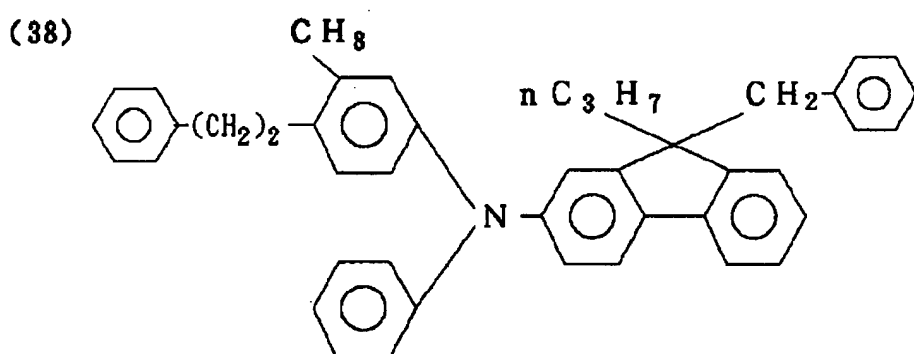
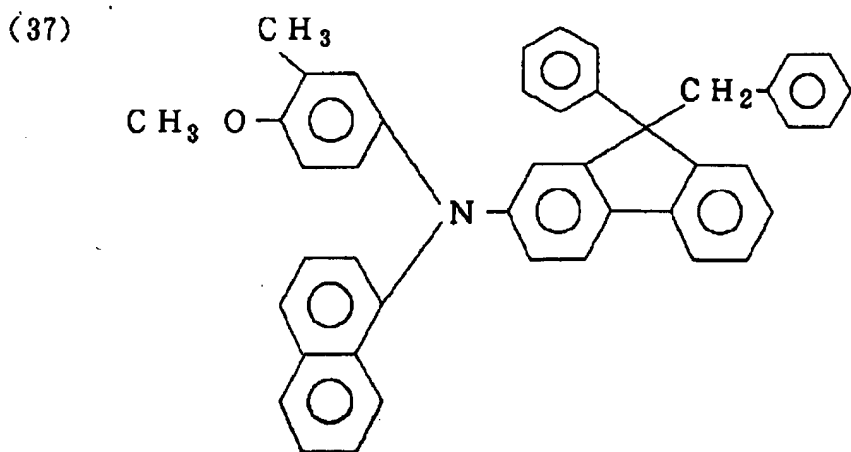


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[0033]

[Formula 15]

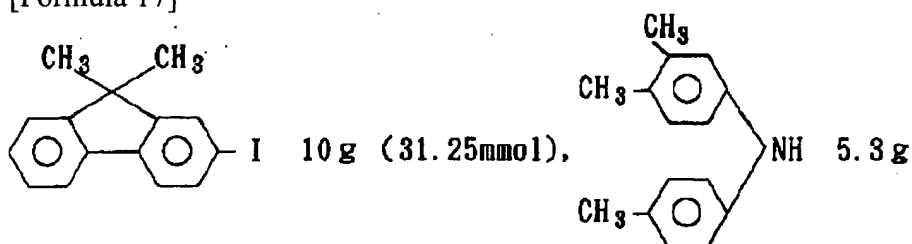


Next, the synthetic example of said compound is shown.

[0034] (Synthesis method of instantiation compound No. (22))

[0035]

[Formula 17]



(25.0mmol), 3.5g (25.0mmol) of anhydrous potassium carbonate, and 3.2g (50.0mmol) of copper powder were added to

0-dichlorobenzene 100ml, and heating-under churning reflux was performed for 8 hours. After [radiationnal cooling] suction filtration was carried out, and the solvent was removed from filtrate under reduced pressure. Separation purification of the residue was carried out with the silica gel column, and 7.1g (71% of yield) of the purpose compounds was obtained.

[0036] Other compounds are compounded by the same technique.

[0037] The photo conductor of this invention is constituted combining the charge transportation matter which consists of a fluorene compound shown by the above general formulas [1], and the suitable charge generating matter.

[0038] As a configuration of a sensitization layer, the following gestalten are mentioned, for example.

(1) The charge generating matter The layer / charge transportation matter to contain The fluorene compound shown by the general formula [1] of layer this invention containing the layer (3) charge generating matter containing the layer / charge generating matter containing the layer (2) charge transportation matter to contain, the layer / charge generating matter containing the layer (4) charge generating matter containing the charge transportation matter, and the charge transportation matter Since it has high transportation ability to an electron hole, it can use as charge transportation matter in the sensitization layer of the above-mentioned gestalt. the case where forward electrification is desirable negative electrification and in the case of (2) when the gestalt of a sensitization layer is (1), and it is (3) and (4) -- forward and negative electrification -- either can be used.

[0039] Furthermore, in the electrophotography photo conductor of this invention, a protective layer and an insulating layer may be prepared in the front face of a sensitization layer for adhesive improvement or charge impregnation control. In addition, the configuration of the photo conductor of this invention is not limited to the above-mentioned basic configuration.

[0040] In addition, the gestalt of (1) is desirable especially among the above-mentioned configurations, and it explains further below at a detail.

[0041] As a conductive base material in this invention, the thing of the gestalt shown below, for example can be mentioned.

(1) What made metals, such as aluminum, an aluminium alloy, stainless steel, and copper, the plate configuration or the drum configuration.

(2) What carried out thin film formation by vapor-depositing or laminating metals, such as aluminum, palladium, a rhodium, gold, and platinum, on non-conductive base materials, such as glass, resin, and paper, or the conductive base material of the above (1).

(3) What was formed by vapor-depositing or applying the layer of conductive compounds, such as a conductive polymer, tin oxide, and indium oxide, on non-conductive base materials, such as glass, resin, and paper, or the conductive base material of the above (1).

[0042] As effective charge generating matter used for this invention, the following matter is mentioned, for example. These charge generating matter may be used independently and may be combined two or more kinds.

(1) Azo system pigments, such as monoazo, bis-azo, and tris azo (2) Polycyclic quinone system pigments, such as perylene system pigment (5) Anthraquinone, such as indigo system pigment (4) perylene acid anhydrides, such as phthalocyanine system pigment (3) indigo, such as a metal phthalocyanine and a nonmetal phthalocyanine, and a thioindigo, and perylene acid imide, and a pyrene quinone (6) The layer containing mineral matter charge generating matter, such as SUKUWARIRIUMU coloring matter (7) pyrylium salt, a thio pyrylium salt (8) triphenylmethane-color system coloring matter (9) selenium, and amorphous silicon, Namely, a charge generating layer can distribute the above charge generating matter to a suitable binder, and can form it by carrying out coating of this on a conductive base material. Moreover, it can form also by forming a thin film with dry process, such as vacuum evaporatio, a spatter, and CVD, on a conductive base material.

[0043] Although it can choose from bending resin wide range as the above-mentioned binder, for example, polycarbonate resin, polyester resin, polyarylate resin, butyral resin, polystyrene resin, polyvinyl-acetal resin, diallyl phthalate resin, acrylic resin, methacrylic resin, vinyl acetate resin, phenol resin, silicon resin, polysulfone resin, the styrene-butadiene copolymer resin, an alkyd resin, an epoxy resin, a urea-resin, vinyl chloride vinyl acetate copolymer resin, etc. are mentioned, it is not limited to these. these are independent -- again -- as a copolymer polymer -- one sort -- or two or more sorts may be mixed and you may use.

[0044] The resin contained in a charge generating layer has 40 or less preferably desirable % of the weight 80 or less % of the weight. Moreover, as for especially the thickness of a charge generating layer, it is desirable to use 5 micrometers or less as a thin film layer with 0.01 micrometers - 2 micrometers.

[0045] Moreover, various sensitizers may be added in a charge generating layer.

[0046] The layer containing the charge transportation matter, i.e., a charge transportation layer, can be formed

combining the fluorene compound shown by said general formula [1], and suitable adhesive resin. As bending resin used for a charge transportation layer here, what is used for said charge generating layer is mentioned, and photoconductivity macromolecules, such as a polyvinyl carbazole and a polyvinyl anthracene, are mentioned further. [0047] As for the blending ratio of coal of this binder and the fluorene compound of a general formula [1], it is desirable to make a fluorene compound into the 10 - 500 weight section per binder 100 weight section.

[0048] It connects as electrically as an above-mentioned charge generating layer, and a charge transportation layer has the function in which these charge carriers can be conveyed to a front face while receiving the charge carrier poured in from the charge generating layer under existence of electric field. Although thickness cannot be thickened beyond the need since this charge transportation layer has the limitation that a charge carrier can be conveyed, the range of 10 micrometers - 30 micrometers is especially desirable 5 micrometers - 40 micrometers.

[0049] Moreover, the fluorene compound of a general formula [1] and other charge transportation matter may be mixed and used if needed.

[0050] Furthermore, an antioxidant, an ultraviolet ray absorbent, a plasticizer, or the well-known charge transportation matter can also be added if needed in a charge transportation layer.

[0051] In case such a charge transportation layer is formed, it can carry out using coating methods, such as a dip coating method, a spray coating method, a spinner coating method, a roller coating method, a MAIYA bar coating method, and a blade coating method, using a suitable organic solvent.

[0052] The example of an outline configuration of the common imprint type electrophotography equipment which used the electrophotography photo conductor of this invention for drawing 1 was shown.

[0053] In drawing, 1 is the drum-type photo conductor of this invention as image support, and a rotation drive is carried out with a predetermined peripheral velocity in the direction of an arrow head a core [shaft 1a]. This photo conductor 1 receives homogeneity electrification of forward or negative predetermined potential in the peripheral surface with the electrification means 2 in the rotation process, and, subsequently the light figure exposure L is received with an image exposure means by which it does not illustrate, in the exposure section 3 (slit exposure, laser-beam scan exposure, etc.). Thereby, sequential formation of the electrostatic latent image corresponding to an exposure image is carried out at the photo conductor peripheral surface.

[0054] Subsequently toner development of the electrostatic latent image is carried out with the development means 4, and the sequential imprint is carried out in the field of the imprint material P to which the toner development image was synchronous-picking-taken out from the non-illustrated feed section with rotation of a photo conductor 1 between the photo conductor 1 and the imprint means 5 by the imprint means 5, and paper was fed.

[0055] It dissociates from a photo conductor side, and the imprint material P which received the image imprint is introduced to the image fixing means 8, and is printed out as a duplication (copy) in response to image fixing outside the plane.

[0056] In response to removal of the imprint remaining toner, a clarification side is formed with the cleaning means 6, electric discharge processing is further carried out by the pre-exposure means 7, and the front face of the photo conductor 1 after an image imprint is repeatedly used for image formation.

[0057] Generally as a homogeneity electrification means 2 of a photo conductor 1, corona-electrical-charging equipment is used widely. Moreover, generally the corona-transfer means is widely used also for imprint equipment 5. As electrophotography equipment, it may combine with one, and may constitute by making two or more things into an equipment unit among components, such as an above-mentioned photo conductor, and a development means, a cleaning means, and this unit may be constituted free [attachment and detachment] to the body of equipment. For example, a photo conductor 1 and the cleaning means 6 may be unified, it may consider as one equipment unit, and you may make it the configuration which can be detached and attached freely using guidance means, such as a rail of the body of equipment. At this time, you may constitute with an electrification means and/or a development means in the direction of the above-mentioned equipment unit.

[0058] When using electrophotography equipment as a copying machine or a printer, the light figure exposure L reads and signal-izes the reflected light from a manuscript, the transmitted light, or a manuscript, and is performed by the scan of a laser beam, the drive of an LED array, or the drive of a liquid crystal shutter array with this signal.

[0059] In using it as a printer of facsimile, the light figure exposure L turns into exposure for printing received data. Drawing 2 shows one in this case with a block diagram.

[0060] A controller 11 controls the image read station 10 and a printer 19. The whole controller 11 is controlled by CPU17. The reading data from the image read station 10 are transmitted to a distant office through a sending circuit 13. The data which received from the distant office are sent to a printer 19 through a receiving circuit 12. Predetermined image data is memorized in an image memory 16. The printer controller 18 is controlling the printer 19. 14 is a

telephone.

[0061] Decode processing is performed by CPU17 and the image information (image information from the remote terminal connected through the circuit) received from the circuit 15 is stored in the image memory 16 one by one, after getting over in a receiving circuit 12. And if at least 1-page image information is stored in memory 16, image recording of the page will be performed. CPU17 reads the image information of one page from memory 16, and sends out the 1-page image information decrypted by the printer controller 18. A printer controller 18 controls a printer 19 so that it may perform image information record of the page, if the 1-page image information from CPU17 is received.

[0062] In addition, CPU17 is receiving the following page during record by the printer 19.

[0063] Reception and record of an image are performed as mentioned above.

[0064] It not only uses the electrophotography photo conductor of this invention for an electrophotography copying machine, but it can use it for electrophotography applicable fields, such as a laser beam printer, a CRT printer, an LED printer, a liquid crystal printer, and laser platemaking, widely.

[0065]

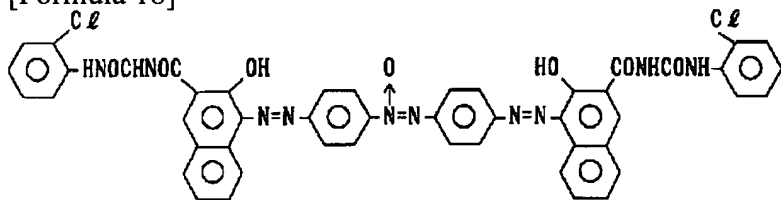
[Example] Hereafter, this invention is explained according to an example.

[0066] Example (1)

4g of bis-azo pigments shown with the following structure expression was distributed by the sand mill for 40 hours with the liquid which dissolved 2g (whenever [butyral-ized] 70-mol%) of butyral resin in cyclohexanone 100ml, and coating liquid was adjusted.

[0067]

[Formula 18]



It applied by my YABA and the charge generating layer was created so that the thickness after drying this coating liquid on an aluminum sheet might be set to 0.15 micrometers.

[0068] Next, said instantiation compound No.(19) 8g and 9g (weight average molecular weight 35,000) of polycarbonate resin were dissolved in mono-chlorobenzene 70g as charge transportation matter, this liquid was previously applied by my YABA on the charge generating layer, the charge transportation layer whose desiccation thickness is 20 micrometers was prepared, and the two-layer electrophotography photo conductor was created.

[0069] Thus, after carrying out corona electrical charging of the created electrophotography photo conductor by -5kV by the static method using electrostatic tracing paper testing-device Model-SP -428 made from Kawaguchi Electrical and electric equipment and holding for 1 second in a dark place, it exposed by illuminance 20Lux and the electrification property was investigated.

[0070] Light exposure (E1/5) required to decrease the potential (V1) when carrying out a dark decay to surface potential (V0) for 1 second to one fifth as an electrification property was measured.

[0071] furthermore, the photo conductor created by this example in order to measure fluctuation of the bright section potential when using it repeatedly, and umbra potential -- the Canon, Inc. make -- it stuck on the cylinder for photo conductor drums of PPC copying machine NP-3825, the 3000-sheet copy was performed by this opportunity, and fluctuation of the bright section potential (VL) after the first stage and a 3000-sheet copy and umbra potential (VD) was measured. In addition, early VD VL It set up so that it might be respectively set to -700V and -200V.

[0072] Moreover, **** was made to adhere to the front face of the electrophotography photo conductor created as mentioned above as an accelerated test of the cracking crack of a sensitization layer, and it observed whether the cracking crack of a sensitization layer would have happened after 4-hour neglect under ordinary temperature normal relative humidity.

[0073] Moreover, **** was made to adhere to the front face of the electrophotography photo conductor created as mentioned above as an accelerated test of crystallization of the charge transportation matter, and it observed whether crystallization of the charge transportation matter would have taken place after neglect for three days at 45 degrees C. The result is shown in the following table 1.

[0074]

[Table 1]

表 1

実施例	V _o (-V)	V _i (-V)	E _{1/5} (lux·sec)	初期電位		3000枚耐久後電位		感光層の ヒビ割れ	電荷輸送物質 の結晶化
				V _o (-V)	V _L (-V)	V _o (-V)	V _L (-V)		
(1)	-705	-695	1.6	-700	-200	-695	-205	なし	なし

Example (2) - (10), example of a comparison (1) - (4)

In this example, as a charge transportation compound used in said example (1), instead of instantiation compound No. (19) Instantiation compound No. (1), Used (5), (12), (15), (17), (20), (22), (33), and (39), the pigment of the following structure was used as charge generating matter, and also the electrophotography photo conductor was created by the same approach as an example (1).

[0075] The electrophotographic properties of each photo conductor were measured by the same approach as an example (1).

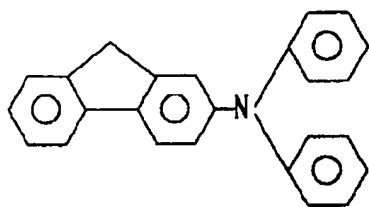
[0076] Moreover, for the comparison, the following compound was used as charge transportation matter, by the same

approach, the electrophotography photo conductor was created and electrophotographic properties were measured. Each result is shown in Table 2 and 3 below.

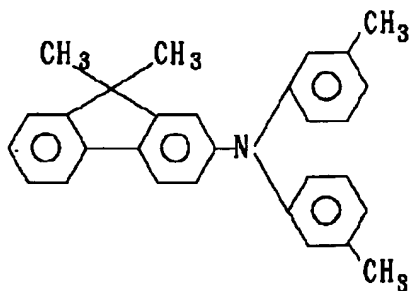
Comparison compound [0077]

[Formula 19]

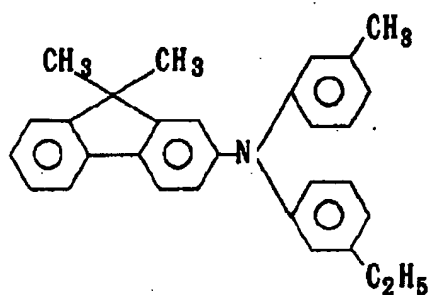
(1)



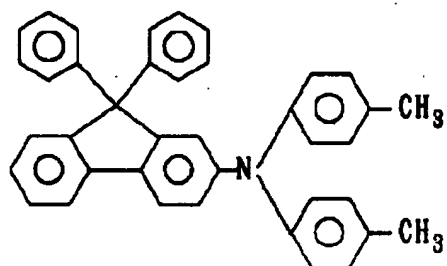
(2)



(3)



(4)



[0078]

[Table 2]

表 2

実施例	例 化合物 No.	V _o (-V)	V _i (-V)	E _{1/2} (lux·sec)	初 期		3000枚耐久後		感光層の ヒビ割れ	電荷輸送物質 の結晶化
					V _o (-V)	V _L (-V)	V _o (-V)	V _L (-V)		
(2)	(1)	700	690	2.2	700	200	685	235	なし	なし
(3)	(5)	695	690	2.1	700	200	682	225	なし	なし
(4)	(12)	690	685	1.7	700	200	700	202	なし	なし
(5)	(15)	705	700	1.6	700	200	695	205	なし	なし
(6)	(17)	710	700	1.9	700	200	695	210	なし	なし
(7)	(20)	700	690	1.8	700	200	685	210	なし	なし
(8)	(22)	700	695	1.6	700	200	690	200	なし	なし
(9)	(33)	700	690	2.0	700	200	700	225	なし	なし
(10)	(39)	690	685	2.1	700	200	695	218	なし	なし

[0079]

[Table 3]

表 3

比較例	比較化合物 No.	V ₀ (-V)	V ₁ (-V)	E _{1/2} (lux·sec)	初期		3000枚耐久後		感光層の ヒビ割れ	電荷輸送物質 の結晶化
					V _D (-V)	V _L (-V)	V _D (-V)	V _L (-V)		
(1)	(1)	705	700	2.8	700	200	685	265	ヒビ割れ 少	大きな結晶が析出
(2)	(2)	705	700	2.2	700	200	660	230	ヒビ割れ 多	大きな結晶が析出
(3)	(3)	700	695	2.1	700	200	650	225	ヒビ割れ 多	大きな結晶が析出
(4)	(4)	690	685	2.2	700	200	630	250	ヒビ割れ 多	小さな結晶が析出

It can be said that the fluorene compound of a general formula [1] is an extremely excellent electrophotography photo conductor with which it excels in sensibility and the potential stability at the time of repeat use extremely compared with a comparison compound, and crystallization of the cracking crack of a sensitization layer or the charge transportation matter does not take place, either so that clearly from Table 2 and 3.

[0080] Example (9)

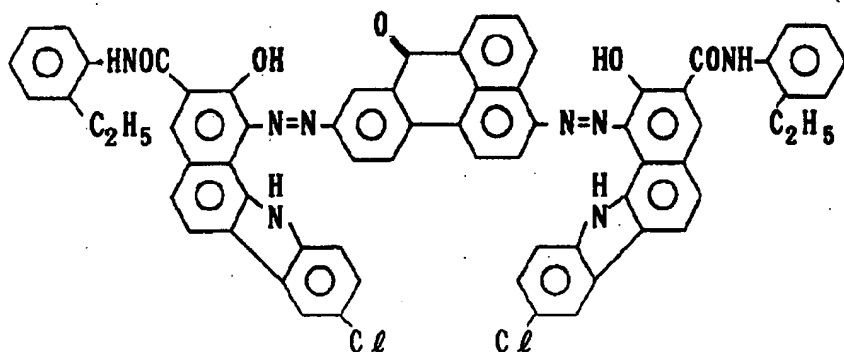
On the aluminum substrate, the liquid which dissolved 5g (weight average molecular weight 30,000) of N-methoxymethyl-ized 6 Nylon and 10g (weight average molecular weight 30,000) of alcoholic fusibility

copolymerization Nylon in methanol 90g was applied by my YABA, and the under-coating layer whose thickness after desiccation is 1 micrometer was prepared.

[0081] Next, distribution was performed for 4.5g (70% of rates of butyral-izing, weight average molecular weight 23,000) of 4.5g polyvinyl butyral resin of charge generating matter, and dioxane 170g shown with the following structure expression by the ball mill disperser for 27 hours. It applied with the blade coating method on the under-coating layer which manufactured these dispersion liquid previously, and the charge generating layer whose thickness after desiccation is 0.2 micrometers was formed.

[0082]

[Formula 20]



Next, said instantiation compound No.(18) 8g and 9g (weight average molecular weight 55,000) of polymethylmethacrylate resin were dissolved in mono-chlorobenzene 70g, it applied with the blade coating method on the charge generating layer formed previously, and the charge transportation layer whose thickness after desiccation is 21 micrometers was formed.

[0083] Thus, -5kV corona discharge was performed to the created photo conductor. The surface potential at this time (initial potential V0) was measured. Furthermore, the surface potential after leaving this photo conductor for 1 second in a dark place was measured. Sensibility is the potential V1 after carrying out a dark decay. It evaluated by measuring light exposure (6 : [E1/] $\mu\text{J}/\text{cm}^2$) required decreasing to one sixth. Under the present circumstances, the ternary system semiconductor laser (output: 5mW; oscillation wavelength of 780nm) of a gallium / aluminum / arsenic was used as the light source. These results were as follows.

[0084]

V0 :-700(v) V1 :-698(v)

E1/6 : 1.0 ($\mu\text{J}/\text{cm}^2$)

Next, the above-mentioned photo conductor was attached in the laser beam printer (Canon LBP-CX) which is an electrophotography method printer of the reversal method equipped with semiconductor laser same as the above, and the actual image formation test was performed. The conditions are as follows. Surface potential after *-proof [primary]; Surface potential;-150v (light exposure J/cm2 of 2.0micro) imprint potential +700v after -700v and image exposure, Development polarity; Negative polarity, process speed;50 mm/sec, development condition (development bias);-450, an after [image exposure] scanning method; image scan, Primary electrification pre-exposure; although the Rhine scan was carried out according to the alphabetic signal and the picture signal and red complete exposure of 50 Lux-sec and image formation performed the laser beam, the print with good alphabetic character and image was obtained.

[0085] Furthermore, when ***** of 3,000 continuation was performed, the print stabilized from the first stage to 3,000 sheets was obtained.

[0086] Moreover, especially abnormalities were not seen in the cracking crack accelerated test of a sensitization layer, or the crystallization accelerated test of the charge transportation matter.

[0087] Example (10)

In addition to the liquid which melted 1.5g of phenoxy resin, the ball mill distributed titanyloxyphthalocyanine 2g to cyclohexanone 45g for 18 hours. Applied these dispersion liquid by my YABA on the aluminum sheet, it was made to dry at 90 degrees C for 1 hour, and the 0.2-micrometer charge generating layer was formed.

[0088] Next, applied by my YABA on the charge generating layer which formed previously the liquid which dissolved said instantiation compound No.(26) 10g and 9g (weight average molecular weight 50,000) of bisphenol Z mold polycarbonate resin in mono-chlorobenzene 90g, it was made to dry at 120 degrees C for 1 hour, and the 19-micrometer charge transportation layer was formed. Thus, the created photo conductor was measured by the same approach as an example (9). This result is shown below.

[0089]

V0 :-705(v) V1 :-700(v)

E1/6 : 0.50 (mJ/cm²)

Moreover, especially abnormalities were not seen in the cracking crack accelerated test of a sensitization layer, or the crystallization accelerated test of the charge transportation matter.

[0090] Example (11)

4-(4-dimethylamino phenol)-2 and 6-diphenyl thia pyrylium perchlorate 1.5g and said instantiation charge transportation compound No.(24) 3.0g were mixed in 100g of toluene (50 weight sections)-dioxane (50 weight sections) solutions of copolymerized polyester resin (weight average molecular weight 40,000), and the ball mill distributed for 24 hours. Applied these dispersion liquid by my YABA on the aluminum sheet, it was made to dry at 90 degrees C for 2 hours, and the 12-micrometer sensitization layer was formed. Thus, the created photo conductor was measured by the same approach as an example (1). This result is shown in the following table 4.

[0091]

[Table 4]

表 4

実施例	V_o (-V)	V_i (-V)	$E_{1/5}$ (lux·sec)	初期電位		3000枚耐久後電位		感光層の ヒビ割れ	電荷輸送物質 の結晶化
				V_D (-V)	V_L (-V)	V_D (-V)	V_L (-V)		
(11)	700	690	3.4	700	200	695	210	なし	なし

[0092]

[Effect of the Invention] The electrophotography photo conductor which contains the fluorene compound of a general formula [1] as explained above is high sensitivity, and on the occasion of the continuation image formation by repeat electrification and exposure, fluctuation of bright section potential and umbra potential is small excellent in endurance, and can offer the extremely excellent electrophotography photo conductor with which crystallization of the cracking crack of a sensitization layer or the charge transportation matter moreover does not take place, either again.

[Translation done.]

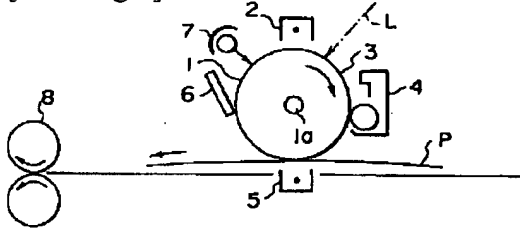
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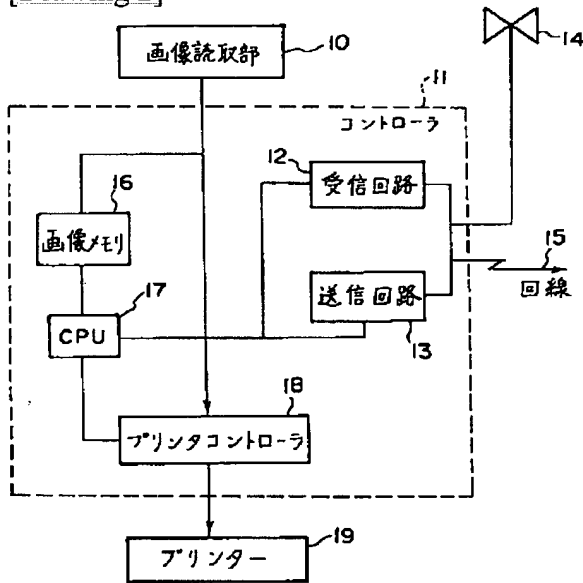
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DRAWINGS

[Drawing 1]



[Drawing 2]



[Translation done.]

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